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⊞ BHC3 Inventory Optimization

Reduce Inventory Costs and Free Up Working Capital While Meeting Service Level Targets

BHC3 Inventory Optimization applies advanced AI, machine learning, and optimization techniques to help oil & gas companies across the value chain reduce inventory levels of parts, raw materials and finished goods (e.g., gasoline, jet fuel, petroleum coke) while maintaining confidence that they will have sufficient safety stock and be able to meet customer service level agreements.

Many companies in the oil & gas industry (e.g., petrochemical manufacturers) deploy material requirements planning (MRP) software as part of their traditional enterprise resource planning (ERP) solution. MRPs support inventory planning and management by calculating the quantities that need to be purchased or ordered based on the demand forecast, available inventory, lead times, and safety stock to meet customer service levels. However, most MRP systems are not designed to optimize inventory levels by learning continuously from data and modeling uncertainties (e.g., longer than expected supplier lead times, less than expected supplier quantities, demand forecast uncertainty). They also lack the ability to simulate changes to MRP re-order parameters. As a result, oil & gas companies often adopt conservative inventory levels to maintain buffer against supply uncertainties that MRP systems cannot account for.

BHC3 Inventory Optimization solves these problems by considering several real-world uncertainties including variability in demand, supplier delivery times, quality issues with parts delivered by suppliers, and production line disruptions. BHC3 Inventory Optimization then dynamically and continuously optimizes reorder parameters in order to minimize inventory holding s and shipping costs for each part.

To do this, BHC3 Inventory Optimization aggregates data from disparate source systems including production orders (actuals and planned), demand forecasts, bills of material, inventory movements (e.g., arrivals from suppliers, consumption in a production line, intra- and inter-facility shipments), historical settings of re-order parameters, lead time and shipping costs from suppliers, and part-level costs for each location where inventory is maintained.

BHC3 Inventory Optimization is interoperable with other BHC3 Supply Chain Suite applications.

Feature Summary

- **AI-based stochastic inventory optimization**
  Leverage advanced AI algorithms with configurable parameters (e.g., frequency, confidence interval) to generate optimum re-order parameters to optimize inventory levels by material+location combination

- **Interpretable AI recommendations with evidence packages**
  Understand, approve (manually or automatically) or modify AI-generated recommendations based by identifying the sources of uncertainty (e.g., supplier time, supplier quantity, blocked material movements, demand) that drive machine learning algorithm recommendations

- **Real-time monitoring and notifications**
  View inventory metrics in real-time to identify anticipated issues with inventory levels and analyze root causes; get notified when certain KPIs exceed thresholds

- **Optimization by confidence-level**
  Specify the level of maximum acceptable risk of stock-out for any part to optimize recommendations

- **Summary view for inventory analysts**
  View inventory savings to date, actual and optimized inventory by location on dashboard, and prioritized lists of high-opportunity parts, leading to faster value-realization
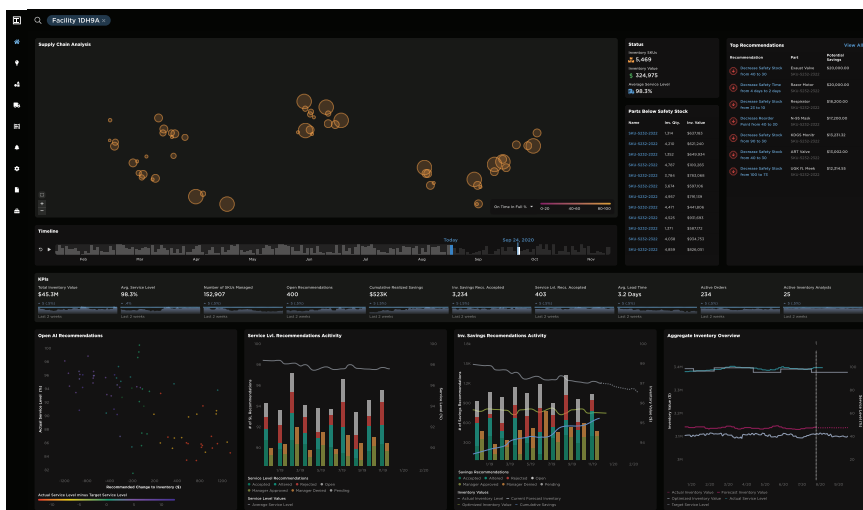
Figure 1. *In the home screen of BHC3 Inventory Optimization, users are able to view potential inventory savings and inventory costs, identify parts with highest savings opportunity, and view recommendations to optimize inventory levels.*

Feature Summary (continued)

- **Detailed view of individual parts**
  View details of individual parts and compare a range of KPIs for a part over time – including actual and optimal inventory, actual and recommended re-order parameters, inventory savings opportunity, re-order parameter compliance, material quality

- **Benchmark parts**
  Compare and benchmark different parts or suppliers over time using a range of KPIs

- **Ability to create 'What-if' scenarios**
  Define scenarios and understand potential business implications of changing re-order parameters before committing the changes to the system

- **Live optimization with real time data integration**
  Dynamically optimize re-order parameters as new data is received; bi-directionally connect to source systems to update reorder parameters

- **Scale to millions of parts**
  Scale to individually optimize inventory levels of millions of parts at different production locations across a manufacturer's global footprint
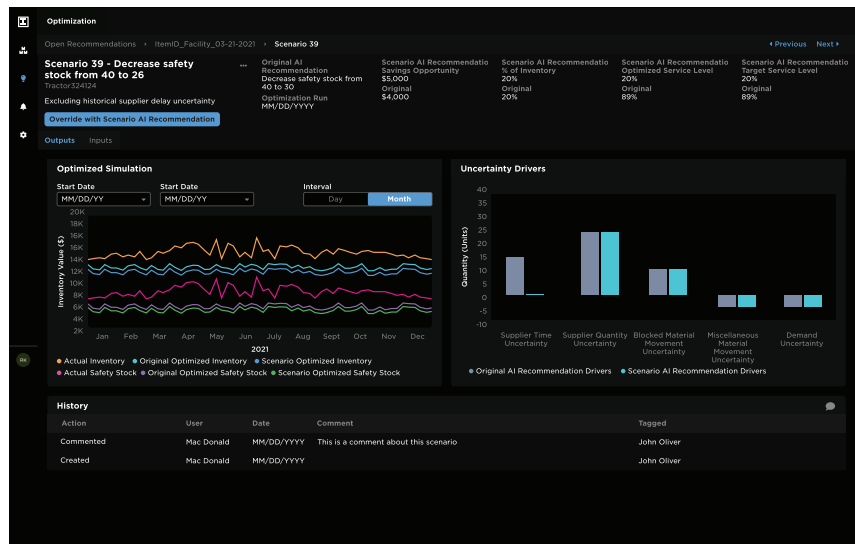

Figure 2. *Using BHC3 Inventory Optimization, users can create scenarios to assess the impact of AI-recommendations on key KPIs such as safety stock and safety time.*

Reduce Inventory Costs, Improve Visibility of Critical Uncertainties, and Increase Productivity

Benefits of BHC3 Inventory Optimization include:

- **Decreased inventory costs and improve cash flow without compromising part availability** by optimizing re-order parameters such as safety stock, safety time subject to necessary confidence levels, leading to lower cost of capital, storage and material handling, insurance, and transportation costs

- **Improved visibility of critical uncertainties** such as seasonality in demand, uncertainty in arrivals, quality issues from suppliers, and production-line disruptions

- **Improved ability to manage and negotiate with suppliers** via understanding of supplier performance, and by simulating effects of order parameters and their impact on suppliers

- **Improved organizational efficiency** through a common view across various departments (e.g. material management, supplier management, logistics management), leading to optimized inventory aligned with organizational goals

- **Increased productivity of inventory analysts** through automated recommendations based on new data, and live integration with operational systems to consistently apply recommendations to supplier orders

- **Reduction in total landed costs** that include standard and expedited shipping costs, as a result of reduced inventory

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